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$\therefore (n-m, l, l); (0, 2\Delta/b, 0)$ , are the coordinates of  $H$  and  $B$ , respectively.  $\therefore l\alpha + (m-n)\gamma = 0$  is the equation to  $BK$ .  
 But  $m-n + l\cos C + (m-n)\cos A - l\cos B = 0$ .  
 $\therefore BK$  is perpendicular to  $AN$ .  $\therefore$  triangle  $ABK$  is isosceles.

II. Solution by G. I. HOPKINS, Instructor in Mathematics and Astronomy, High School, Manchester, N. H.

*Construction:* Join  $HE, HB$ . Extend  $DE$  and draw  $BP$  perpendicular to it.

*Demonstration:* Since  $BP$  and  $AH$  are perpendicular to  $DE$ , they are parallel.  $AD=AE$ , i. e.,  $\triangle ADE$  is isosceles. arc  $ES$ =arc  $SF$ .

$\therefore \angle ENB = \angle EDF$ .  $\therefore \triangle DRH$  and  $\triangle NEB$  are similar.

$\therefore NE/EB = DR/RH$ .  $\angle NEB$  is a right angle.

$\therefore \angle REN$  is complement to  $\angle BEP$ .  $\therefore \angle REN = \angle EBP$ .

$\therefore \triangle REN$  and  $\triangle EBP$  are similar.

$\therefore RE/BP = NE/EB$ ;  $\therefore DR/RH = RE/BP$ .

Since  $DR=RE$ ,  $\therefore RH=BP$ , and  $\therefore RHBP$  is a parallelogram; i. e.,  $BK$  is parallel to  $DE$ .

$\therefore \triangle ABK$  is similar to  $\triangle ADE$ , and is therefore isosceles.

## CALCULUS.

270. Proposed by S. A. COREY, Hiteman, Iowa.

Prove that  $\sum_{x=0}^{x=\infty} \frac{1}{(a^2+x^2)^n} = \frac{\pi}{2a^{2n-1}} \cdot \frac{1}{2} \cdot \frac{3}{4} \cdot \frac{5}{6} \cdots \frac{(2n-3)}{(2n-2)} + \frac{1}{2a^{2n}}$ ,  $n$  being a positive integer  $>1$ .

II. Solution by the PROPOSER.

Performing the finite summation of the problem by the aid of Mac-laurin's Summation-formula,

$$\sum u_x = C + \int u_x dx - \frac{1}{2}u_x + \frac{B_1}{2!} \frac{du_x}{dx} - \frac{B_2}{4!} \frac{d^3 u_x}{dx^3} + \dots$$

(See Boole's *Finite Differences*, page 90), we readily obtain the above expression for the sum, if we substitute for the definite integral,

$\int_0^\infty \frac{dx}{(a^2+x^2)^n}$ , its well known value,  $\frac{\pi}{2} \cdot \frac{1}{2} \cdot \frac{3}{4} \cdot \frac{5}{6} \cdots \frac{(2n-3)}{(2n-2)} \cdot \frac{1}{a^{2n-1}}$ , if  $n$  is a positive integer  $>1$ .

The solution in the May MONTHLY involves the erroneous assumption that  $\sum_{x=0}^{x=\infty} \frac{1}{(a^2+x^2)^n} = \int_0^\infty \frac{dx}{(a^2+x^2)^n}$ .